MIC1344 Evaluation Board

Smart, 3A, Two-Channel, Power ORing Switch

General Description

The MIC1344 is an advanced two input, one output, hot-swappable, power multiplexer. It has both automatic and manual input selection (ASEL\ and BSEL\), and four status outputs.

The MIC1344 evalaution board provides a method to evaluate the part, and understand its functionality. The evaluation board is not intended to demonstrate the minimum size or most compact PCB layout.

The basic parameters of the evaluation board are:

1. VINA or VINB supply voltage:
   - 2.8V to 5.5V
2. OUT current:
   - 0 to 3A

Datasheets and support documentation are available on Micrel's web site at: www.micrel.com.

Power-Up Precautions

Applying a negative voltage to the VINA or VINB terminals may damage the device. In addition, the maximum VIN operating voltage of the MIC1344 evaluation board is 5.5V.

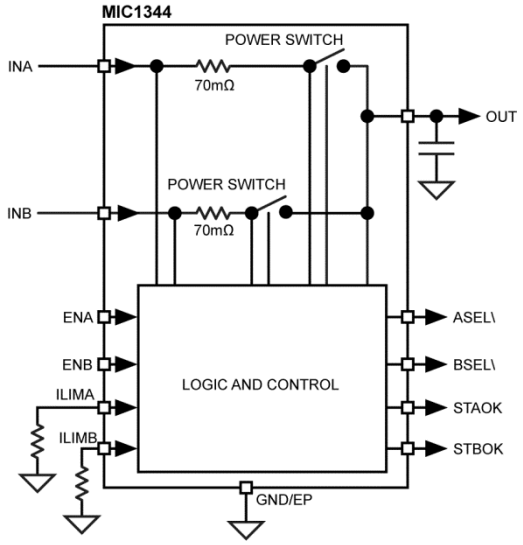
Getting Started

1. Set the ILIM resistors to the correct value for input source capability and the load (see Equation 1). The evaluation board is provided with a current limit of 3A.
2. Connect a power supply to the VINA (J2) and/or VINB (J4), terminals.
3. Connect a 5V supply to VCC (J1 or TP1).
4. Connect the load to VOUT (J6).
5. Turn on the VIN power and observe the operation of the MIC1344 in the status LEDs, and the output voltage (see Table 2 for an explanation of the status LEDs).

Ordering Information

Part Number	Description
MIC1344YFT EB	MIC1344 Smart, 3A, Two-Channel, Power Oring Switch Evaluation Board

Typical Application



Evaluation Board Description

The current limit for the MIC1344 VINA and VINB is set on the board to be ≈3A by resistors R11 and R12 being 825Ω. If a different current limit is desired, adjust R11 for VINA or R12 for VINB using Equation 1:

$$R_{ILIM} = \frac{2485}{I_{CL} - 146\mu A} \quad \text{Eq. 1}$$

Where:

I_{CL} = Desired current limit (A)

R_{ILIM} = Resistor value for ILIM pin (Ω)

Setting resistor R_{ILIM} equal to zero is not recommended as it will disable current limiting.

The MIC1344 ENA and ENB are not connected to a supply rail; the internal 570kΩ resistor on each of the enable pins pulls the pins low, placing the part into automatic mode. If another mode is desired the enable pins can be connected to an external voltage VCC via jumpers TP3 or TP5 or driven directly, see *Evaluation Board Schematic*. Table 1 shows how the MIC1344 will route the input power as controlled by the ENA and ENB input pins.

Table 1. ENA and ENB Input Power Selection

ENA	ENB	Power Input Selected
0	0	The higher voltage on either INA or INB automatically selected if > V_{UVLO}.
0	1	No input selected (can be used for cascading other MIC1344 power inputs).
1	0	INA power input selected if $V_{INA} > V_{UVLO}$.
1	1	INB power input selected if $V_{INB} > V_{UVLO}$.

VCC is a supply pin to power up the pull-up resistors on ASEL\, BSEL\, STAOK, STBOK, as well as drive ENA, and ENB. VCC can be connected to VOUT or an external supply, please see the “Digital Status Output Pins” sub-section in the *Application Information* section of the MIC1344 datasheet for further information.

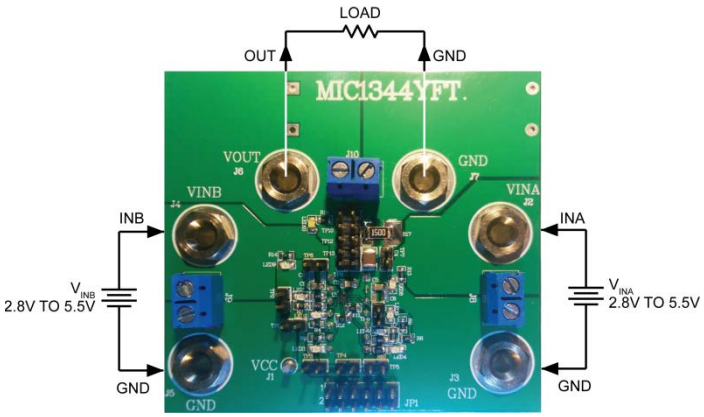


Figure 1. MIC1344YFT Evaluation Board

LED Key

There are nine status LEDs included on the MIC1344 evaluation board, see Table 2. As seen in the *Evaluation Board Schematic*, the blue LEDs (LED4, LED5, LED6 and LED8) are associated with the functionality of the INA input. The green LED’s (LED1, LED2, LED3 and LED9), are associated with the functionality of the INB input. The one white LED (LED10) is associated with OUT. When ENA or ENB LEDs are turned on, then the enable input control signals are high. Refer to Table 1 for an explanation of the enable signals. STAOK or STBOK LEDs will light only if a fault should occur. The MIC1344 datasheet includes a complete explanation of the STAOK and STBOK and the input conditions that cause these pins to go active low (low impedance). ASEL\ and BSEL\ indicate which of the two inputs (A or B), is selected. When an input is selected, the associated LED turns on.

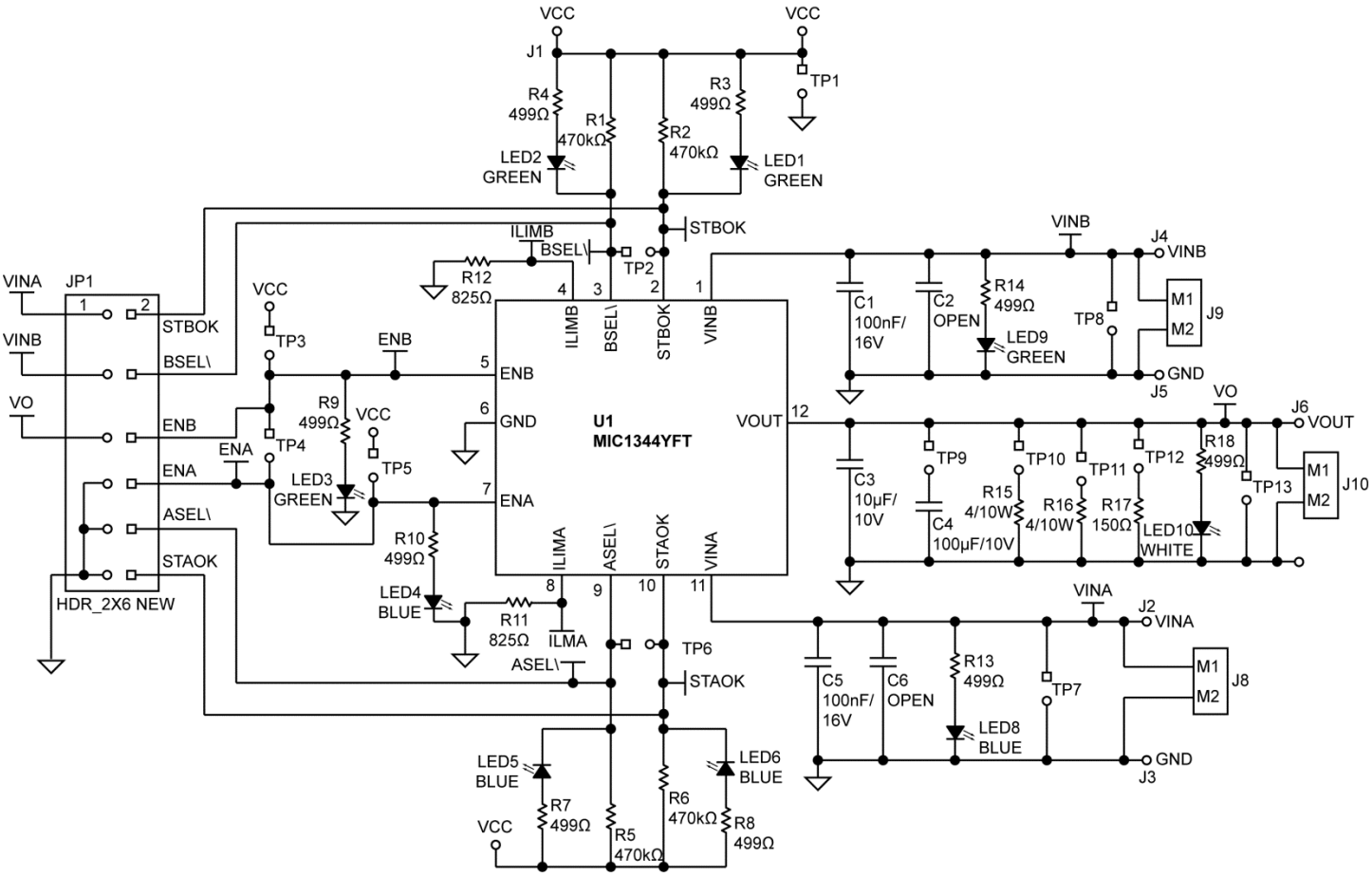
Table 2. MIC1344 Status LED Description

LED #	Color	Pin	Function
1	Green	STBOK	Lights when fault occurs on VINB, or thermal shutdown
2	Green	BSEL\	Lights when VINB is selected
3	Green	ENB	Lights when ENB is high
4	Blue	ENA	Lights when ENA is high
5	Blue	ASEL\	Lights when VINA is selected
6	Blue	STAOK	Lights when fault occurs on VINA, or thermal shutdown
8	Blue	VINA	Lights when VINA is above ≈2.5V
9	Green	VINB	Lights when VINB is above ≈2V
10	White	VOUT	Lights when VOUT voltage is above ≈2.5V

Table 3. MIC1344 Evaluation Board Test Points

Designation	Jumper Function
TP1	Power for LEDs and Enables (VCC).
TP2	**"□"** side of TP2 is BSEL\, **"O"** side of TP2 is STBOK.
TP3	Putting a jumper across TP3 connects ENB to VCC
TP4	**"□"** side of TP4 is ENB, **"O"** side of TP4 is ENA.
TP5	Putting a jumper across TP5 connects ENA to VCC
TP6	**"□"** side of TP6 is ASEL\, **"O"** side of TP4 is STAOK.
TP7	Voltage for Input A (VINA).
TP8	Voltage for Input B (VINB).
TP9	Putting a jumper across TP9 adds a 100µF capacitor on the VOUT.
TP10	Putting a jumper across TP10 puts a 4Ω (5W) load resistor on the VOUT.
TP11	Putting a jumper across TP11 puts a 4Ω (5W) load resistor on the VOUT.
TP12	Putting a jumper across TP12 puts a 150Ω (5W) load resistor on VOUT.
TP13	Output Voltage (VOUT).
JP1	Header for connection to trouble shooting signals. See the *Evaluation Board Schematic* for details.

Evaluation Board Schematic



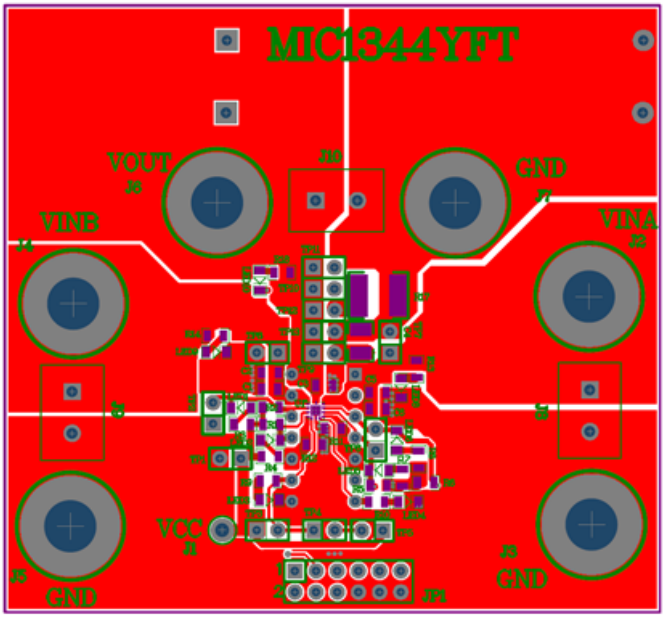
Bill of Materials

Item	Part Number	Manufacturer	Description	Qty.
C1, C5	C2012X5R1H104K085AA	TDK[1]	100nF Ceramic Capacitor, 50V, X5R, Size 0805	2
C2, C6	Open		Open	2
C3	C2012X5R1A106M	TDK	10µF Ceramic Capacitor, 10V, X5R, Size 0805	1
C4	C3216X5R1A107M160AC	TDK	100µF Ceramic Capacitor, 10V, X5R, Size 1206	1
R1, R2, R5, R6	ERJ-6ENF4703V	Panasonic[2]	470kΩ, Tolerance 1%, Size 0805	4
R3, R4, R7, R8, R9, R10, R13, R14, R18	ERJ-6ENF4990V	Panasonic	499Ω, Tolerance 1%, Size 0805	9
R11, R12	ERJ-6ENF8250V	Panasonic	825Ω, Tolerance 1%, Size 0805	2
R15, R16	ALSR104R000FE12	Vishay[3]	4Ω 10W 5% AXIAL	2
R17	RMCP2010FT150R	Stackpole[4]	150Ω, Tolerance 1%, Size 2010	1
U1	**MIC1344YFT**	**Micrel, Inc.**[5]	**Smart, 3A, Two-Channel, Power ORing Switch**	1

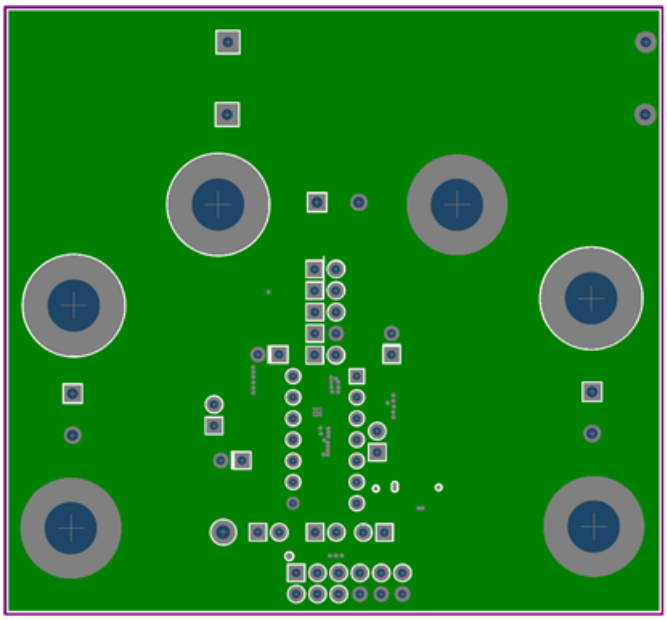
Notes:

1. TDK: www.tdk.com.
2. Panasonic: www.industrial.panasonic.com.
3. Vishay: www.vishay.com.
4. Stackpole Electronics: www.seielect.com.
5. **Micrel, Inc.:** www.micrel.com.

PCB Layout Recommendations

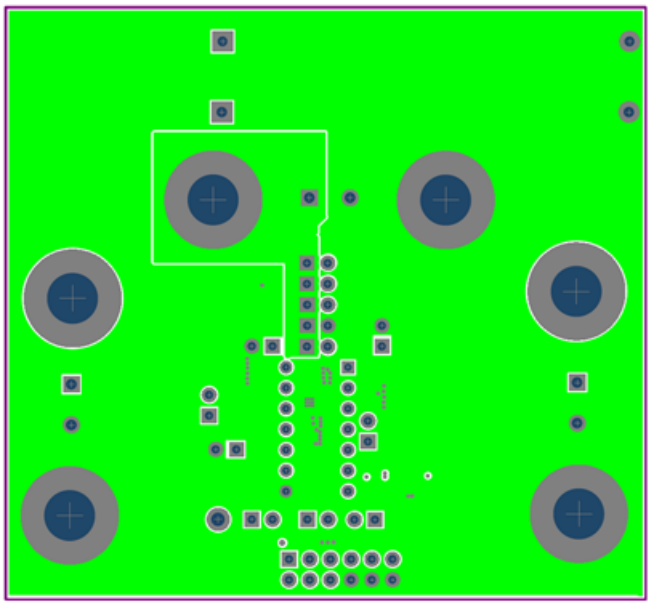


Top Layer

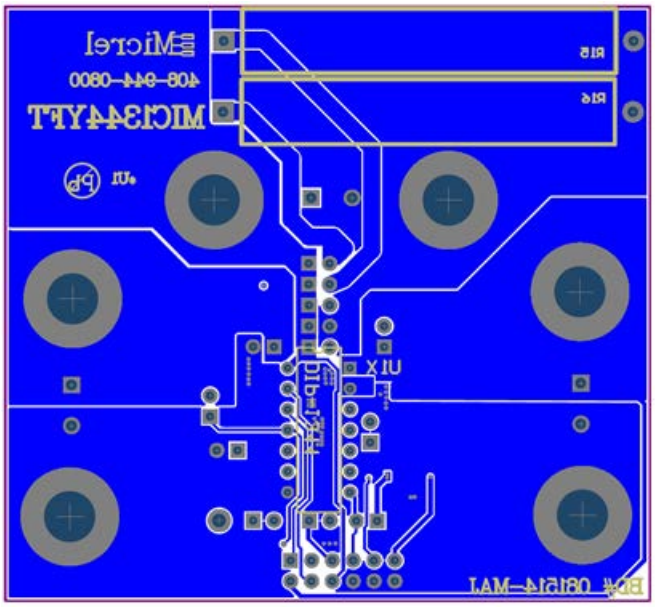


Mid-Layer 1

PCB Layout Recommendations (Continued)



Mid-Layer 2



Bottom Layer

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